Sample Questions for Analytical Proficiency Test

(answers at the end)

1. Consider the algorithm:

   Input x, y

   $$V = \sqrt{x^2 - y^2}$$

   Output V

   For which of these inputs the output would not be a real number?
   A) x=1, y=0
   B) x=3, y=3
   C) x=-2, y=1
   D) x=2, y=-3

2. Consider the following algorithm:

   Input x, y, z

   Assign to z the average value of x and y

   Assign to y the average value of x and z

   Assign to x the average value of y and z

   Output w=x+y+z

   When x = -1, y =1, z = 5 are given as input, the output w is
   A) 5
   B) 10
   C) -0.5
   D) -0.75

3. The points (2,1), (x,5) and (11,7) lie on a straight line. The value of x is
   A) 5
   B) 6
   C) 8
   D) 9

4. The equation of the line that is tangent to the curve $y = x^3 - x$ at the point (1,0) is
   A) $y = 2x - 2$
   B) $y = -2x + 2$
   C) $y = 2x - 1$
   D) $y = \dfrac{x}{2} - 1$

5. Three numbers are chosen at random from {1,2,3,4,5,6} without replacement and are arranged in increasing order. The probability that the numbers are in Arithmetic Progression (A.P.) is
   A)   0.05
   B)   0.20
   C)   0.30
   D)   0.50

6. Let $f(x) = e^x + e^{-x}$. Consider the following statements:
   I. f is increasing on the interval $(-\infty, 0)$ and decreasing on the interval $(0, \infty)$
   II. f has a global minimum at $x = 0$
   A)   Both Statements I and II are correct
   B)   Only Statement I is correct
   C)   Only Statement II is correct
   D)   Both Statements I and II are incorrect

7. The maximum value of uv when u, v satisfies the condition $u^2 + v^2 = 1$ is
   A)   1
   B)   2
   C) $\sqrt{2}$
   D)   0.5

Answer Key

1. D
   x=2, y=-3
2. D
   -0.75
3. C
   8
4. A
   $y = 2x - 2$
5. C
   0.30
6. C
   Only Statement II is correct
7. D
   0.5